

A Web Architecture to Geographically Interrogate CHIRPS Rainfall and eMODIS NDVI for Landuse Change

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ABSTRACT

Monitoring of rainfall and vegetation over the continent of Africa is important for assessing the status of crop health and agriculture, along with long-term changes in land use change. These issues can be addressed through examination of long-term precipitation (rainfall) data sets and remote sensing of land surface vegetation and land use types. Two products have been used previously to address these goals: the Climate Hazard Group Infrared Precipitation with Stations (CHIRPS) rainfall data, and multi-day composites of Normalized Difference Vegetation Index (NDVI) from the USGS eMODIS product. Combined, these are very large data sets that require unique tools and architecture to facilitate a variety of data analysis methods or data exploration by the end user community. To address these needs, a web-enabled system has been developed to allow end-users to interrogate CHIRPS rainfall and eMODIS NDVI data over the continent of Africa. The architecture allows end-users to use custom defined geometries, or the use of predefined political boundaries in their interrogation of the data. The massive amount of data interrogated by the system allows the end-users with only a web browser to extract vital information in order to investigate land use change and its causes. The system can be used to generate daily, monthly and yearly averages over a geographical area and range of dates of interest to the user. It also provides analysis of trends in precipitation or vegetation change for times of interest. The data provided back to the end-user is displayed in graphical form and can be exported for use in other, external tools. The development of this tool has significantly decreased the investment and requirements for end-users to use these two important datasets, while also allowing the flexibility to the end-user to limit the search to the area of interest.